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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,595	07/26/2001	Masafumi Hashimoto	GNE441A	7183

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EXAMINER

DONG, DALEI

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/912,595

Applicant(s)

HASHIMOTO ET AL.

Examiner

Dalei Dong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/912,595.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Specification***

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The disclosure is objected to because of the following informalities: Wording of the specification is vague and indefinite for example "several" and "near".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3, 4 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 3 and 4, the phrase "near" and "approximately" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding to claim 6, the relationship lacks units of measurement.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,721,561 to Kishino

Regarding to claims 1 and 7, Kishino discloses in Figure 24 to 26, "an image display device of the first embodiment includes an anode substrate 302 and a cathode substrate 303 which are arranged in a manner to be opposite to each and spaced from other at a predetermined interval defined therebetween, and side plates (not shown) arranged between the anode substrate 302 and the cathode substrate 303, which cooperate with each other to form an envelope 304. The envelop 304 thus formed is then evacuated to a high vacuum" (column 11, line 35-42). Kishino also discloses "the anode substrate 302 has a light-permeable anode conductor 305 formed all over an inner surface thereof. The anode conductor 305 is provided thereon with phosphor layers 306 of desired

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luminous colors in a dot-like or stripe-like manner, resulting in forming a display section 307. The anode conductor 305 is provided on a portion thereof interposed between each adjacent two phosphor layers 306 with a light shielding mask 308" (column 11, column 43-51). Kishino further discloses in Figure 22, "which is viewed from a side of the anode electrodes. As shown in Figure 22, the anode lead-out electrodes A1, A2, and A3 are led out of the anode electrode elements 106-1, 106-2 and 106-3 on both sides of the substrate, respectively. The gate electrodes 103 (103-1, 102-2, ..., 103-1) are formed in a manner to be spaced from and parallel to the anode electrode elements 106-1 to 106-3. The gate electrodes 103 each are provided with gate lead-out electrodes GT1, GT2, ..., GT1 in a manner to be led out thereof, respectively" (column 3, line 30-40).

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,721,561 to Kishino in view of U.S. Patent No. 5,959,403 to Lee.

Regarding to claim 2, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to

the outside. However, Kishino does not disclose the discharge medium emits vacuum UV rays and the phosphor layer emits visible light due to the vacuum UV rays. Lee teaches in Figure 4, "in each of the discharge cells in the aforementioned plasma display panel, the electrons, moving along an electric field formed between the first and second sustain electrodes 16 and 17, are caused to rotate because of magnetic fields formed by the magnetic walls in directions shown by arrows, enhancing collision of the electrons with neutral particles to emit more ultraviolet rays required for excitation of the fluorescent material film 15, thereby the luminance of the screen becomes higher because of the higher excitation of the fluorescent material film 15" (column 4, line 14-24). It would have been obvious to one of ordinary skills in the art at the time the invention was made to have utilize the ultraviolet ray excitation of the fluorescent material film of Lee for the light-emitting device of Kishino in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

Regarding to claim 8, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to the outside. However, Kishino does not disclose a dielectric layer formed over the electrode and a protection layer formed on the dielectric layer. Lee teaches in Figure 3, "the plasma display panel with magnetic partition walls in accordance with a first embodiment of the present invention includes a front substrate 11, a rear substrate 12, partition walls 13a, a pair of a first , and a second sustain electrodes 16 and 17, an address

electrode 14, a fluorescent material film 15, a dielectric film 18, and an MgO protection film 19” (column 4, line 4-10). It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the dielectric layer in combination with the protection layer of Lee for the light-emitting device of Kishino in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

9. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,721,561 to Kishino in view of U.S. Patent No. 5,747,100 to Petersen.

Regarding to claims 3 and 4, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to the outside. However, Kishino does not disclose the discharge medium emits vacuum UV rays and the phosphor layer emits near UV light due to the vacuum UV rays. Petersen discloses “the cadmium-doped zinc gallate material must be formed prior to combination with the high-resistance, light-emitting phosphor, because this prior art process requires treatments at temperature upwards of 1300°C. Many of the known high-resistance, light-emitting phosphors cannot withstand such high temperatures without chemically reacting with the UV emitting phosphor to form a new low emissive compound or without discomposing to form a new low emissive compound” (column 2, line 54-63). Petersen also teaches “the functional relationship between the UV-emitting

material and the light-emitting phosphor, they must be admixed together physically in the form of powders. In such a manner, particles of the UV-emitting material are dispersed between particles of the light-emitting material” (column 3, line 2-7). Petersen further teaches “the UV-emitting phosphor is included because, for many prior art phosphors, UV excitation provides more efficient light emission than electron excitation” (column 3, line 14-17). Petersen further yet teaches “the UV radiation is received by the light-emitting phosphor of layer 50 which is thereby excited to emit visible light having a predetermined wavelength, or color, which is determined by the identity of the light-emitting phosphor” (column 10, line 61-65). It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the UV-emitting phosphor of Petersen with the desired wavelength for the light-emitting device of Kishino in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,721,561 to Kishino in view of U.S. Patent No. 5,801,483 to Watanabe.

Regarding to claim 5, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to the outside. However, Kishino does not disclose a photocatalyst layer formed on an outer surface of the envelope. Watanabe teaches “international laid open patent application

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No. WO 94/11092 and Japanese laid open patent application No. 7-11104 disclose an air treating method using a photocatalyst under interior illumination. According to those applications, the photo catalytic material is excited by ultraviolet radiation from a conventional fluorescent lamp" (column 1, line 45-50). It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the photocatalyst material of Watanabe on the outer surface of the envelope of Kishino in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,721,561 to Kishino in view of U.S. Patent No. 5,185,554 to Nomura.

Regarding to claim 6, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to the outside. However, Kishino does not disclose the relationship of the distance between electrodes and the vertical distance of the envelope. Nomura teaches "for the modulating electrode in the present embodiment, a nickel material is used and a group of modulating electrodes are prepared with a width of 106 mm and a pitch of 2 mm each" (column 7, line 21-24). Nomura also teaches "a face plate (like the face plate 10 as shown in Figure 11) having a fluorescent member (an image forming member) is provided at 5 mm distance from the rear plate of the electron-beam generator prepared according to the

process described above” (column 8, line 8-13). It is old and well known in the art of Paschen’s Law whose relates the voltage at which a gas breaks down into a plasma, the so called spark or firing voltage, to the product of the pressure of the gas,  $p$  (in mm Hg), times the distance,  $d$  (in cm), between the electrode. It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the electrode configuration and the separation of the two face plates of Nomura for the light-emitting device of Kishino; further the electrode configuration can be revised according to the Paschen’s Law with the desired design choice in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,721,561 to Kishino in view of U.S. Patent No. 5,508,584 to Tsai.

Regarding to claim 9, Kishino discloses a flat-type light-emitting device comprising an envelope, a phosphor layer, first and second electrode including linear parts and finally the envelope allows the visible light to penetrate through the envelope to the outside. However, Kishino does not disclose the detailed layout of the electrodes. Tsai teaches in Figure 7, “three conductive lines 82, 83 and 84. Conductive lines 82 and 84 have a comb-like shape while line 83 has an interweaving shape, wherein all three lines are interlocking as shown schematically in Figure 7. These lines are formed to a width of between about 30 and 100 micrometers” (column 6, line 1-5). It would have

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been obvious to one of ordinary skills in the art at the time the invention was made to utilize the detailed layout of electrodes of Tsai for the light-emitting device of Kishino in order to have an even or uniform distribution of the light intensity without luminance degradation and provide stable discharge paths between all the adjoining linear parts of electrodes in the inner space of the envelope.

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the states of the art of the light-emitting device.

U.S. Patent No. 5,592,056 to Peyre.

U.S. Patent No. 5,785,570 to Bruni.

U.S. Patent No. 5,821,685 to Peterseon.

U.S. Patent No. 6,225,738 to Kim.

U.S. Patent No. 6,235,270 to Ishii.

European Patent Application No. 0,630,679 A1 to Watanabe.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.  
November 13, 2002

  
Sandra O'Shea  
Supervisory Patent Examiner  
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